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| 10/629,711 | 07/30/2003 | Yuka Utsumi | 503.34972CX2 | 5363 |
| 20457 | 7590 | 06/30/2006 | EXAMINER | |
| ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873 | | | DUDEK, JAMES A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2871 | |

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/629,711 | Applicant(s) UTSUMI ET AL. | |
| | Examiner James A. Dudek | Art Unit 2871 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-18 and 21-34 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 3-5,7-9,15-17,21-24,26-28,30-33 is/are rejected.
- 7) ☒ Claim(s) 6,10,14,18,25,29 and 34 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

The previous office action is withdrawn and this office action is sent to replace that action. As the previous office action was a final office action, this action is made final in its place.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3-18, 21-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 26, 30, 7, 15, 21 and those that depend thereon, the language "when a drive voltage is applied thereto so as to vary from a dark state to a light state" is unclear, as no specific meaning can be ascertained. In the interview of 8/26/05, it was understood the language to mean that the optical effect take place of the full range of voltages, however what appears to be the closest meaning is that the a drive voltage varies the display from a light to a dark state- so there is no implication of intermediate voltages or brightness levels. As the examiner understands applicant to mean that the relationship is maintained at all voltages from a light to a dark state, the language has been read accordingly.

Regarding claims 3, 11 and those that depend thereon, the language "when a drive voltage is applied thereto so as to vary in the range of a minimum voltage required for a visual display on said liquid crystal panel to a maximum voltage" is unclear, as no specific meaning can be ascertained. In the interview of 8/26/05, it was understood the language to mean that the optical effect take place of the full range of voltages, however what appears to be the closest meaning is that the a drive voltage varies the display from a minimum to a maximum value- so there is no

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implication of intermediate voltages. As the examiner understands applicant to mean that the relationship is maintained at all voltages from a light to a dark state, the language has been read accordingly.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahadur pages.

Bahadur discloses on page 266 in figure 10.34 the properties of a cell (D-STN, which is a birefringent mode), where the highest value for displaying white is shown as 1.79 volts, where the peak of the curve is at 450 nanometers, which means that the highest point for blue (around 480) is higher than all of the values for green and red, and the highest value for green is itself higher than all of the values for red, as the line slopes continuously downwards. All of the other voltage values have the same curve but with a shorter wavelength so the relationship is maintaining while varying. The cell is also shown from the color perspective in figure 10.35 as having the property of being on the blue side of white for the entire range from select to nonselect, and the cell is indicated as advantageously having much less wavelength dependence than the non D type STN, and there is a discussion on page discussing the advantage of the curves of the D-STN "This results in more achromatic appearance in the select, nonselect and all intermediate states", also giving a strong teaching for the curves that occur in the D-STN.

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Lacking from the disclosure is the clear disclosure of a backlight, and one that emits red green and blue. Backlit was the preferred lighting mode. This is discussed Bahadur on page 188 “the application opportunities for backlighting are increasing in order to obtain high viewability”, with the details of the backlighting system discussed on page 192-193. Therefore one of ordinary skill would have found reason, motivation or suggestion to employ the backlight of pages 192-193 for the benefit of high viewability.

So Bahadur discloses the elements of claim 11 including a liquid crystal display apparatus comprising: a liquid crystal panel (the D-STN) including a pair of polarizers (required to show an image when illuminated from a backlight). Not shown, but obvious in accordance with the above discussion is a back light provided at a back side of said liquid crystal panel.

The D-STN is clearly double refraction mode, as it is a birefringence effect, birefringence being double refraction, and as discussed above, meets the a characteristic of spectral transmittance required to satisfy the following equation, $x > z$, when a drive voltage is applied thereto so as to vary in the range of a minimum voltage required for a visual display on said liquid crystal panel to a maximum voltage, where: wherein said liquid crystal panel is an active matrix type liquid "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a longest wavelength in the range of wavelengths designated for blue light illuminated from said light source, and "z" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a maximum value of the intensity in the range of wavelengths designated for red light illuminated from said light source.

The limitation of claim 12 is met as it is by definition that the range of wavelengths designated for blue light illuminated from said light source corresponds to 400 nm to 500 nm, and the range of wavelengths designated for red light illuminated from said light source corresponds to 600 nm to 700nm, as the color a wavelength corresponds to is physical property and therefore inherent.

The limitations of 13 are met as a pair of polarizers is arranged so as to sandwich a pair of substrates in said liquid crystal panel, and a birefringent film arranged between a polarizer and a substrate. Here substrates are required to hold in the liquid crystal and the polarizers required as

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discussed above, so are inherent if not disclosed (layers that appear to be substrates are in 10.31, which shows the cells of the applied figures, as well as polarizers and electrodes), and the second STN of the D-STN is a birefringent film as is the primary STN layer.

Claims 26-28, 30-33, 3-5, 7-9, 15-17, 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahadur as applied above, and further in view of Matsumoto.

Here the claims add to those discussed above the additional limitation of the liquid crystal cell being active matrix (a claim by claim analysis is presented below). Matsumoto page 70 that the active matrix technique enables driving more lines than the passive or multiplex technique (i.e. enables more resolution). Therefore one of ordinary skill would have found reason, motivation and suggestion to modify the device of Bahadur to employ an active matrix type driving matrix for the benefit discussed above.

Therefore, in accordance with the discussion above, Bahadur discloses the elements of claim 26 of a liquid crystal display apparatus comprising: a liquid crystal panel including a pair of polarizers, and a back light provided at a back side of said liquid crystal panel is not shown but obvious as discussed above, however also not shown is the liquid crystal panel is an active matrix type liquid crystal panel. Also shown in accordance with the discussion above is the characteristic of spectral transmittance required to satisfy the following equation, $x > y > z$, when a drive voltage is applied thereto so as to vary from a dark state to a light state, where: "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a longest wavelength in the range of wavelengths designated for blue light illuminated from said light source, "y" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a maximum value of the intensity in the range of wavelengths designated for green light illuminated from said light source, and "z" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a maximum value of the intensity in the range of wavelengths designated for red light illuminated from said light source.

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The limitation of claim 27 is met as it is by definition that the the range of wavelengths designated for blue light illuminated from said light source corresponds to 400 nm to 500 nm, the range of wavelengths designated for green light illuminated from said light source corresponds to 500 nm to 600 nm, and the range of wavelengths designated for red light illuminated from said light source corresponds to 600 nm to 700nm,, as the color a wavelength corresponds to is physical property and therefore inherent.

The limitations of 28 are met as a pair of polarizers is arranged so as to sandwich a pair of substrates in said liquid crystal panel, and a birefringent film arranged between a polarizer and a substrate. Here substrates are required to hold in the liquid crystal and the polarizers required as discussed above, so are inherent if not disclosed (layers that appear to be substrates are in 10.31, which shows the cells of the applied figures, as well as polarizers and electrodes), and the second STN of the D-STN is a birefringent film as is the primary STN layer.

In accordance with the discussion above, Bahadur discloses the elements of claim 30 of a liquid crystal display apparatus comprising: a liquid crystal panel including a pair of polarizers, and a back light provided at a back side of said liquid crystal panel is not shown but obvious as discussed above, however also not shown is the liquid crystal panel is an active matrix type liquid crystal panel. Also shown in accordance with the discussion above is the characteristic of spectral transmittance required to satisfy the following equation, $x > y > z$, when a drive voltage is applied thereto so as to vary from a dark state to a light state, where: "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to one of 490nm and 500nm; "y" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to 545nm', and "z" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to 630nm. As discussed above, the relationship holds for any associated wavelength.

The limitation of claim 31 is met as it is by definition that the "x" is a value of the transmittance in said liquid crystal panel corresponds to 490nm.

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The limitation of claim 32 is met as it is by definition that the "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to 500nm. As discussed above, the relationship holds for any associated wavelength.

The limitations of 33 are met as a pair of polarizers is arranged so as to sandwich a pair of substrates in said liquid crystal panel, and a birefringent film arranged between a polarizer and a substrate. Here substrates are required to hold in the liquid crystal and the polarizers required as discussed above, so are inherent if not disclosed (layers that appear to be substrates are in 10.31, which shows the cells of the applied figures, as well as polarizers and electrodes), and the second STN of the D-STN is a birefringent film as is the primary STN layer.

In accordance with the discussion above, Bahadur discloses the elements of claim 3 of a liquid crystal display apparatus comprising: a liquid crystal panel including a pair of polarizers, and a back light provided at a back side of said liquid crystal panel is not shown but obvious as discussed above, however also not shown is the liquid crystal panel is an active matrix type liquid crystal panel. Also shown in accordance with the discussion above is the double refraction mode and a characteristic of spectral transmittance required to satisfy the following equation, $x > y > z$, when a drive voltage is applied thereto so as to vary in the range of a minimum voltage required for a visual display on said liquid crystal panel to a maximum voltage where: "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a longest wavelength in the range of wavelengths designated for blue light illuminated from said light source', "y" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a maximum value of the intensity in the range of wavelengths designated for green light illuminated from said light source', and "z" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a maximum value of the intensity in the range of wavelengths designated for red light illuminated from said light source. The color a wavelength corresponds to is physical property and therefore inherent.

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The limitation of claim 4 is met as it is by definition that the range of wavelengths designated for blue light illuminated from said light source corresponds to 400 nm to 500 nm, the range of wavelengths designated for green light illuminated from said light source corresponds to 500 nm to 600 nm, and the range of wavelengths designated for red light illuminated from said light source corresponds to 600 nm to 700nm, as the color a wavelength corresponds to is physical property and therefore inherent.

The limitations of 5 are met as a pair of polarizers is arranged so as to sandwich a pair of substrates in said liquid crystal panel, and a birefringent film arranged between a polarizer and a substrate. Here substrates are required to hold in the liquid crystal and the polarizers required as discussed above, so are inherent if not disclosed (layers that appear to be substrates are in 10.31, which shows the cells of the applied figures, as well as polarizers and electrodes), and the second STN of the D-STN is a birefringent film as is the primary STN layer.

In accordance with the discussion above, Bahadur discloses the elements of claim 7 of a liquid crystal display apparatus comprising: a liquid crystal panel including a pair of polarizers, and a back light provided at a back side of said liquid crystal panel is not shown but obvious as discussed above, however also not shown is the liquid crystal panel is an active matrix type liquid crystal panel. Also shown in accordance with the discussion above is the in a double refraction mode, and has a characteristic of spectral transmittance required to satisfy the following equation, $x > y > z$, when a drive voltage is applied thereto so as to vary from a dark state to a light state, where: "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a longest wavelength in the range of wavelengths designated for blue light illuminated from said light source, "y" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a maximum value of the intensity in the range of wavelengths designated for green light illuminated from said light source; and "z" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a maximum value of the intensity in the range of wavelengths designated for red light illuminated

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from said light source. The color a wavelength corresponds to is physical property and therefore inherent.

The limitation of claim 8 is met as it is by definition that the range of wavelengths designated for blue light illuminated from said light source corresponds to 400 nm to 500 nm, the range of wavelengths designated for green light illuminated from said light source corresponds to 500 nm to 600 nm, and the range of wavelengths designated for red light illuminated from said light source corresponds to 600 nm to 700nm, as the color a wavelength corresponds to is physical property and therefore inherent.

The limitations of 9 are met as a pair of polarizers is arranged so as to sandwich a pair of substrates in said liquid crystal panel, and a birefringent film arranged between a polarizer and a substrate. Here substrates are required to hold in the liquid crystal and the polarizers required as discussed above, so are inherent if not disclosed (layers that appear to be substrates are in 10.31, which shows the cells of the applied figures, as well as polarizers and electrodes), and the second STN of the D-STN is a birefringent film as is the primary STN layer.

In accordance with the discussion above, Bahadur discloses the elements of claim 15 of a liquid crystal display apparatus comprising: a liquid crystal panel including a pair of polarizers, and a back light provided at a back side of said liquid crystal panel is not shown but obvious as discussed above, however also not shown is the liquid crystal panel is an active matrix type liquid crystal panel. Also shown in accordance with the discussion above is the in a double refraction mode, and has a characteristic of spectral transmittance required to satisfy the following equation, $x > z$, when a drive voltage is applied there to so as to vary from a dark state to a light state, where: "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a longest wavelength in the range of wavelengths designated for blue light illuminated from said light source, and "z" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to a maximum value of the intensity in

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the range of wavelengths designated for red light illuminated from said light source. The color a wavelength corresponds to is physical property and therefore inherent.

The limitation of claim 16 is met as it is by definition that the range of wavelengths designated for blue light illuminated from said light source corresponds to 400 nm to 500 nm, and the range of wavelengths designated for red light illuminated from said light source corresponds to 600 nm to 700nm, as the color a wavelength corresponds to is physical property and therefore inherent.

The limitations of 17 are met as a pair of polarizers is arranged so as to sandwich a pair of substrates in said liquid crystal panel, and a birefringent film arranged between a polarizer and a substrate. Here substrates are required to hold in the liquid crystal and the polarizers required as discussed above, so are inherent if not disclosed (layers that appear to be substrates are in 10.31, which shows the cells of the applied figures, as well as polarizers and electrodes), and the second STN of the D-STN is a birefringent film as is the primary STN layer.

In accordance with the discussion above, Bahadur discloses the elements of claim 21 of a liquid crystal display apparatus comprising: a liquid crystal panel including a pair of polarizers, and a back light provided at a back side of said liquid crystal panel is not shown but obvious as discussed above, however also not shown is the liquid crystal panel is an active matrix type liquid crystal panel. Also shown in accordance with the discussion above is the double refraction mode, and has a characteristic of spectral transmittance required to satisfy the following equation, $x > y > z$, when a drive voltage is applied thereto so as to vary from a dark state to a light state, where: "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to one of 490nm and 500nm; "y" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to 545 nm, and "z" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to 630nm.

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The limitation of claim 22 is met as it is by definition that "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to 490nm. As discussed above, the relationship holds for any associated wavelength.

The limitation of claim 23 is met as it is by definition that "x" is a value of the transmittance in said liquid crystal panel at a wavelength which corresponds to 500nm. As discussed above, the relationship holds for any associated wavelength.

The limitations of 24 are met as a pair of polarizers is arranged so as to sandwich a pair of substrates in said liquid crystal panel, and a birefringent film arranged between a polarizer and a substrate. Here substrates are required to hold in the liquid crystal and the polarizers required as discussed above, so are inherent if not disclosed (layers that appear to be substrates are in 10.31, which shows the cells of the applied figures, as well as polarizers and electrodes), and the second STN of the D-STN is a birefringent film as is the primary STN layer.

Allowable Subject Matter

Objection to claims 6,10,14,18,25,29,34 for the additional limitation of further comprising a plurality of electrodes provided on at least one of said pair of substrates in said liquid crystal panel to produce an electric field substantially in parallel with surfaces of said pair of substrates. Please note that applicant's device appears to achieve the claimed relationship not by the use of birefringent films (or a second LC material layer), but by the LC layer itself alone. It is possible that claiming in such a way as to eliminate the possibility that other films are used to modify the cell behavior would overcome the reference, however a substantial enablement question may be raised. Applicant achieves this established goal with a parallel field cell- it appears that enablement may only be for that cell type. Does simply setting the value of the $d \Delta n$ slightly thinner work in any other cell type other than those that employ a rotation that is parallel to the substrate?

Response to Arguments

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Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kawagishi et al 5414542 in Kawagishi et al shows a ferroelectric liquid crystal cell with a transmittance in the on and off states which meets the above criterion (see figure 5)- lacks gradation values, but teachings can be used to show obviousness of ferroelectric with gradation.

Asano 5048933 this reference was originally applied and actually meet the claimed slope of the curve, but the on is in the absence of a voltage, so doesn't meet the language of "when a drive voltage is applied thereto so as to vary from a dark state to a light state", as it appears the removal of a voltage causes a dark state.

Ohnishi 5089906 has the appropriate curve, but lacks gradation values.

Applicant's amendment in the office action of 7/25/05, the response to which this action is a replacement office action, necessitated the new ground(s) of rejection presented in the previous office action and now sent in this office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

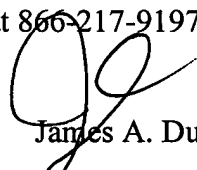
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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Dudek whose telephone number is 571-272-2290. The examiner can normally be reached on M-F 10:30-6:00.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James A. Dudek

Primary Examiner

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